

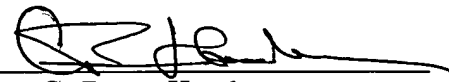
REMARKS

This Preliminary Amendment is being submitted to present a substitute specification and abstract that are in proper form, so as to facilitate prosecution of the application; and to amend the original claims so as to more particularly point out and distinctly claim the subject matter which the applicant regards as the invention, using standard English and eliminating non-standard phraseology and expressions, and other informalities in the claims, and to otherwise generally present the claims in standard form according to U.S. practice, so as to place the claims in allowable condition prior to commencement of substantive examination. Original claims 1 - 11 are canceled, without prejudice. New claims 12 - 22 are presented by this Amendment. New claims 12 - 22 are all of the claims pending in the application after entry of this Preliminary Amendment. It is respectfully requested that the first Office Action be directed to the application as amended herein. No new matter is introduced into any part of the specification, abstract, and claims by the substitute documents and amendments presented herein.

Respectfully submitted,

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~~[ABSTRACT]~~ DELIVERY APPARATUS FOR MEDICAL FLUIDS

~~[ABSTRACT]~~ BACKGROUND OF THE INVENTION

A. ~~Technical field of the invention in the claims~~ Field of the invention

5 This invention relates to a medical apparatus, and, more particularly, to a
device for delivering a specific volume of medical fluid via a tube.

[[B.]] Technical ~~problem that the invention intends to solve~~ background
and description of the prior art

Existing delivery apparatus for medical fluids utilizing tubes allow
10 delivery of medical fluids by the expansion pressure of a tubular body which is
inserted into a pipe-conduit having channels and which expands when medical
fluid is injected.

However, its disadvantages are that delivery of a specific volume of
medical fluid is impossible since such expansion results in different expansion
15 pressure for the beginning and later periods of fluid delivery, and also because of

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being configured as a pipe-conduit, and thereby manufactured in an elongated shape, it is inconvenient to carry as it dangles loosely.

~~C. — Gist of solution by the invention~~ SUMMARY OF THE

INVENTION

5 [[A]] The present invention seeks to overcome these problems in the prior art by providing a tubular-body, which when wound circularly, is reduced in size shrinking to a circular shape that maintains constant pressure both in the beginning and later periods of a fluid delivery. Also because it is manufactured in a flat and round shape, it is easy to carry.

10 ~~D. — Important usage of the invention~~

~~Delivery of medical fluids~~

~~[REPRESENTATIVE DRAWING]~~

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Figure 1

[SPECIFICATION]

[TITLE OF INVENTION]

~~Delivery apparatus for medical fluids in flat and round shape~~

5 **[BRIEF DESCRIPTION OF THE DRAWINGS]**

~~Figure 1 is a perspective view showing an example of the assembled structure of the invention.~~

~~Figure 2 is a perspective view showing another example of the assembled structure.~~

10 ~~Figure 3 is a plane view showing affixation of a tubular body in a stretched state.~~

~~Figure 4 is a perspective view showing the outer appearance of the assembly.~~

15 ~~Figure 5 is a cross-sectional view showing an upper case and a lower case, connected with an intermediate ring.~~

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~~Figure 6 is a cross-sectional view of a lid.~~

~~Figure 7 is a cross-sectional view of the prior art.~~

~~<EXPLANATION OF REFERENCE NUMERALS>~~

~~10: upper case~~ ————— ~~20: lower case~~

5 ~~30: intermediate ring~~ ————— ~~40: valve~~

~~50: lid~~

~~[DETAILED DESCRIPTION OF THE INVENTION]~~

~~[PURPOSE OF THE INVENTION]~~

10 ~~[FIELD OF THE INVENTION AND DESCRIPTION OF THE PRIOR ART]~~

The present invention ~~relates to~~ is a delivery apparatus for medical fluids,
which utilizes a ~~tubular-body~~ tubular body, wherein the ~~tubular-body~~ tubular body
is wound and fixed on a ~~projecting-holder~~ projecting holder and maintains the
expansion pressure of the expanding ~~tubular-body~~ tubular body the same for the

beginning and later periods of fluid delivery; and has a flat shape, which not only makes it easy to carry, but also makes it possible to provide diverse designs.

In conventional delivery apparatus for medical fluids utilizing a ~~tubular-~~
~~body~~ tubular body, a ~~tubular-body~~ tubular body (300) is inserted into a ~~pipe-~~
5 ~~conduit~~ pipe conduit (200) usually furnished with a channel, whereby in a state in
which the ~~tubular-body~~ tubular body is closely adhered to the ~~pipe-conduit~~ pipe
conduit, the medical fluid injected through the ~~pipe-conduit~~ pipe conduit (400)
enters into the ~~tubular-body~~ tubular body through the channel and causes the
~~tubular-body~~ tubular body, made of one layer, to expand.

10 Therefore, the expanded ~~tubular-body~~ tubular body(300) allows medical
fluid to be discharged with a strong pressure in the beginning, but, as time passes,
the expanded, one-layered ~~tubular-body~~ tubular body contracts, thereby, causing
the pressure to drop, and results in a decrease in the volume of medical fluid being
discharged, which is disadvantageous.

15 Accordingly, due to such structural shortcoming, when inserting the
conventional ~~tubular-body~~ tubular body into the ~~pipe-conduit~~ pipe conduit, the
~~tubular-body~~ tubular body is in a stretched state, that is, fitted into the ~~pipe-~~

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~~conduit pipe conduit~~, the ~~tubular-body~~ tubular body is stretched and tightly adhered to the ~~pipe-conduit~~ pipe conduit by strong pressure that is to compensate for that variation of pressure in the beginning and later periods.

5 However, in such case not only is there a difficulty in assembly but also there are limitations in selecting material for the ~~tubular-body~~ tubular body that does not change when it expands.

Moreover, another disadvantage is that it is impossible to offer variety in design since the shape of the final product is merely a simple ~~pipe-type~~ pipe type.

[PROBLEM TO BE SOLVED BY THE INVENTION]

10 Therefore, the present invention, having a ~~tubular-body~~ tubular body wound up in two layers on a round ~~projecting-holder~~ projecting holder, and thereby maintaining constant pressure of the tubular body when expanded by the injection of medical fluid, in the beginning and later periods, solves, the problems of the prior arts and also makes it possible to offer a variety in design.

15

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view showing an example of the assembled structure of the invention.

Figure 2 is a perspective view showing another example of the assembled structure.

5 Figure 3 is a plan view showing affixation of a tubular-body in a stretched state.

Figure 4 is a perspective view showing the outer appearance of the assembly.

10 Figure 5 is a cross-sectional view showing an upper case and a lower case, connected with an intermediate-ring.

Figure 6 is a cross-sectional view of a lid.

Figure 7 is a cross-sectional view of the prior art.

~~[DESCRIPTION OF THE PREFERRED EMBODIMENTS]~~ DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION

15 The preferred embodiments ~~will be~~ of the apparatus of the present invention are described in detail below referring to the attached drawings.

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[[The]] In one embodiment of the present invention [[is a]], the structure ~~in which the~~ an upper case (10) and lower case (20), which are assembled as counterparts, and such counterpart assembly enables detaching.

5 Additionally, ~~being~~ this embodiment of the apparatus is equipped with a separate ~~intermediate-ring~~ intermediate ring (30) of specific width, in between of the upper case (10) and the lower case (20), which not only enables easy assembly and a variety of designs, but also ~~various~~ adjustment of the volume of medical fluid capable of being contained, according to the width of the ~~intermediate-ring~~ intermediate ring.

10

As shown in Figure 1, this invention includes an upper case (10), wherein a ~~projecting-holder~~ projecting holder (11) is formed in the center of the upper case (10) for the ~~tubular-body~~ tubular body to be wound upon, a ~~tubular-body~~ tubular body (1) of which both ends are connected to each other and affixed to a ~~branch-conduit~~ branch conduit (2) by affixation member (3), in order to wind onto the

15 ~~projecting-holder~~ projecting holder (11), and a hose (100) is connected to the ~~branch-conduit~~ branch conduit for the flow of medical fluid.

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Additionally, the inner wall of the lower case (20) adheres as tightly as possible to the ~~projecting holder~~ projecting holder (11) of the upper case (10) to prevent the ~~tubular body~~ tubular body (1), wound on the ~~projecting holder~~ projecting holder (11), from separating. An ~~open-groove~~ open groove (12) which
5 has a bore wide enough for the ~~branch-conduit~~ branch conduit (2) to fit is formed to affix the ~~branch-conduit~~ branch conduit (2), and the ~~open-groove~~ open groove (12) is equally divided between the upper case (10) and the lower case (20), with which it combines, and that allows for secure affixing by application of pressure.

Since this is an already known method, a variety of methods ~~can be~~
10 ~~proposed~~ will be apparent to the person of ordinary skill in the art.

Therefore, medical fluid when injected into the hose for medical fluids (100), flows into the ~~branch-conduit~~ branch conduit (2) and expands the ~~tubular-body~~ tubular body (1). Since the expanded two-layered ~~tubular-body~~ tubular body (1) tightly adheres to the ~~projecting holder~~ projecting holder (11) and winds
15 circularly therearound, it contracts as a whole when contracting and thereby, the change of its expansion pressure in the beginning and later periods becomes reduced.

Furthermore, when an ~~intermediate-ring~~ intermediate ring of a specific width is employed between the aforementioned upper case (10) and lower case (20), it is not necessary to prepare additional upper cases (10) and lower cases (20) for situations of different injection volume of medical fluids. By varying the width of the ~~intermediate-ring~~ intermediate ring, it is easy to change its shape according to the different volumes, and thus being able to immediately deliver upon the demand of consumers is its advantage. And it is also possible to offer a variety of designs by making the ~~intermediate-ring~~ intermediate ring (30) in various colors.

Additionally, the combining method to affix the ~~branch-conduit (30)~~ [~~sic;~~ (2)] branch conduit (2) is by forming fixing protrusion (2a) on the ~~branch-conduit~~ branch conduit (2) and by forming fixing grooves (14) on the counter parts of the upper case (10) and lower case (20), which thereby allow firm affixation by combining upon applying force. And an ~~injection-port~~ injection port (2b) is formed on the ~~branch-conduit~~ branch conduit (2) and is combined with an ~~injection-valve~~ injection valve (40) that has ~~one-directional~~ one directional flow, whereby the ~~injection-valve~~ injection valve (40) is exposed through a passageway hole (13) of the upper case (10) and thereafter, medical fluid is injected through

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the ~~injection-valve~~ injection valve (40) which is exposed through the passageway hole (13).

A lid (50), which opens and closes when pressed, is formed in order to cover the passageway hole (13) of the upper case (10) for preventing outside
5 foreign material from entering.

The lid (50) used herein has a scored folding line (51), on the inside of which is formed a slot (52) of V-shape, and the inner side of the scored folding line (51) is fixed to the upper case, so that the outer side is raised to open and close, when the scored folding line is pressed, and a tip of the outer side combines
10 with the upper case (10) having a stopper (15) to allow the passageway hole (13) to open and close.

There is a variety of known methods for the manufacture of a stopper, wherein the stopper can be formed on the lid.

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The ~~branch-conduit~~ branch conduit (2), to which both ends of the ~~tubular-~~
~~body~~ tubular body (1) is connected and fixed, is made out of material that does
not expand due to the injection of medical fluids. A variety of known methods
can be used to affix the ~~tubular-body~~ tubular body (1) connected to such ~~branch-~~
5 ~~conduit~~ branch conduit (2).

However, affixing with an additional affixation member (3), with double
sheathing, if possible, is necessary in order to prevent it from detaching or
cracking, while in a fixed state, due to expansion pressure, and such double
sheathing is possible whether its material is made of the same or a different
10 material as that of the ~~tubular-body~~ tubular body.

Additionally, to prevent detaching, on the ~~branch-conduit~~ branch conduit
(2) is formed a recess groove (2c) which is sufficiently large enough to allow the
affixation member (3) to be inserted through, and on the recess groove is further
formed a rabbet groove (2d), which a projecting ring (31), formed on the
15 affixation member, is fitted into and affixed, and that prevents detaching.

Furthermore, by forming the affixation member in two-layers, and in
order to induce an elastic operation in a situation where the affixation member is

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made out of stiff material, and by having the inside of the affixation member incised and the outside not incised, enables solid affixation.

Additionally, when such affixation member is ~~double-sheathed~~ double sheathed, using the same material as that with which the ~~tubular-body~~ tubular body is made, and afterward is also fixed using a fixing band, it has the same effect of affixation.

When pressure is applied for affixing, the skin of part of the ~~tubular-body~~ tubular body becomes thin, which could expand and crack when pressure is delivered for injection of medical fluid. Double sheathing can solve such a problem.

10: upper case 20: lower case

30: intermediate-ring 40: valve

50: lid

[EFFECTS OF THE INVENTION]

ABSTRACT OF THE DISCLOSURE

~~As stated above, the present invention enables~~ A medical fluid delivery
apparatus for the discharge of a specific and constant volume of medical fluids
5 ~~because~~ includes a two-layered ~~tubular-body~~ tubular body that is wound on a
~~projecting holder~~ projecting holder, which reduces the change in expansion pressure.
Having the ~~tubular-body~~ tubular body wound up ~~allows offering~~ enables a variety in
design. The utilization of an ~~intermediate-ring~~ intermediate ring ~~allows providing~~
enables a variety of products just by exchanging the ~~intermediate-ring~~ intermediate
10 ring ~~[[for]]~~ to provide different capacity volumes of the ~~tubular-body~~ tubular body.